MEDICINE

Cancer Cell Chemical

Laboratory tests with rats and mice have shown that a chemical extract from cancer cells produces a thyroid disturbance.

➤ THE discovery that cancer throws the thyroid glands of animals into a tailspin has put scientists on the trail of a chemical substance which may be the cause of growth of some tumors.

This is reported by a group of University of California scientists supported by the American Cancer Society and the Christine Breon Fund. It apparently is the first discovery of the disturbance by cancer of a generalized metabolic function.

The researchers found that in cancerous rats and mice there is a general decrease in the thyroid's ability to accumulate iodine. Coupled with this is a two-fold increase in the depositing in the skin of thyroglobulin, as compared with normal animals. Thyroglobulin is a chemical parent of the thyroid hormone.

After finding this effect with several types of tumor, the scientists crushed tumor cells of the same types, and injected the resulting homogenates into animals. Though these animals had no growing tumors, the chemical extract of the cancer cells caused the same thyroid disturbances. The conclusion is that a chemical in the cancer cells is responsible for the disturbances.

The scientists hope their studies with radioactive thyroglobulin may reveal the nature of this chemical substance. Subsequently it may be possible to neutralize the substance and control the rate of tumor growth in man, to develop a diagnostic test for cancer, and to gain greater insight into the relationship of the cancer and its host.

The research was done by Drs. Kenneth G. Scott, Warren Bostick, Michael Shimkin, and Joseph G. Hamilton.

The scientists also reported two new methods of synthesizing thyroxin and its precursors, or chemical parents, monoiodo and diiodo tyrosine, which will make these substances less expensive and more easily obtainable.

One method is to allow rats to synthesize thyroxin. After the rats have synthesized the hormone following injection of radioactive iodine, the animals are sacrificed and the hormone extracted.

The other technique involves paper chromatography. Thyroxin and its precursors are readily synthesized in the laboratory but are difficult to separate from impurities by ordinary chemical means.

When the substances are allowed to flow down a vertically placed filter paper, the substances stop at different points. The substances are neatly separated, and, because only minute amounts are needed, sufficient can be recovered from the paper for experimental purposes.

Science News Letter, May 28, 1949

ENGINEERING

Modern Telephony Carrier

➤ THE coaxial cable system, used in sending hundreds of telephone conversations over the line at the same time, is now 20 years old, and its invention received proper notice at the Bell Telephone Laboratories at which the two inventors were present.

The first installation of coaxial cable was at Phoenixville, Pa., late in 1929. There are many thousands of miles of it now in use, and by the end of 1950 approximately 12,000 miles are expected to be installed. This will provide heavy-capacity communication facilities between virtually all the large cities of the East, Midwest and Pacific Coast.

Credit for the invention of the coaxial cable is given by the Bell organization to two of its engineers, Lloyd Espenschied and Herman A. Affel, both of the Bell Laboratories. There has been much improvement since the first type was developed. Today's cable can carry 600 simultaneous telephone conversations, or two television programs, on each pair of the eight tubes included in it. This capacity may some day be doubled, it is expected.

The name coaxial comes from the fact that a copper pipe used as a tube, and a copper wire centered within it, have the same axis. The wire is held in exact position by insulating disks about an inch apart. The tubes are used in pairs, each transmitting in one direction. The tubes confine the electric waves that travel through them with almost the speed of light, and carry them to their destination without the spreading in all directions that takes place in radio broadcasting.

A coaxial tube can carry an extremely wide band of wave frequencies simultaneously, wider in fact than the entire spread of frequencies used by all radio stations in ordinary broadcasting. In order to obtain many different voice pathways for separate conversations within a tube, the frequency band is divided up into separate channels. Crystal filters select the individual voice channels at the cable ends in a manner similar to that by which a radio is tuned in a single station

The coaxial cable, in its lead sheath, is usually placed underground where it is generally safe from breakage from storms and other causes. It is filled with inert nitrogen as another safety measure. Where lightning storms are frequent, the lead cable is protected by a copper coating.

Science News Letter, May 28, 1949

BIOLOGY

Boys Are Increasing in Upper-Class Families

➤ THE proportion of boys born in upper-class families has increased during the last 30 years, so that today the well-to-do papas welcome 125 boy babies into the world for every 100 girls.

This was revealed when Dr. Marianne E. Bernstein, of Purdue University, made a study of 3,898 families of the United States and Germany.

Dr. Bernstein, in HUMAN BIOLOGY (Sept. 1948) attributes the proportional increase in the births of boys to improvement in living conditions in the last 30 years. She also believes that birth control may have an indirect effect by cutting down miscarriage.

The increase occurs in both small and large families.

Science News Letter, May 28, 1949

COAXIAL CABLES—The old and the new in coaxial cables is shown by the Bell Laboratories inventors, Lloyd Espenschied (left) with a section of the cable in the first installation and Herman A. Affel showing the cable of today.